

**BACHELOR OF TECHNOLOGY (CBCS - 2023)**  
**B. Tech. Sem-I Computer Science & Business Systems : WINTER: 2025**  
**SUBJECT: INTRODUCTORY TOPICS IN STATISTICS, PROBABILITY & CALCULUS**

Day : Wednesday  
 Date : 10/12/2025

**W-27622-2025**

Time : 10:00 AM-01:00 PM  
 Max. Marks : 60

**N.B.**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Assume suitable data **WHEREVER** necessary.
- 4) Draw neat diagrams **WHEREVER** necessary.

**Q.1** Describe various methods of collecting primary data. (10)

**OR**

**Q.1** What are some common methods used for collecting secondary data? (10)

**Q.2** Given the data below : (10)

X	2	4	6	8	10	12	14	16
Y	3	6	7	9	12	14	15	18

Find the regression line of Y and X.

**OR**

**Q.2** Find the Karl Pearson's correlation coefficients for the following data : (10)

X	15	17	19	21	23	25	27	29
Y	12	15	17	16	18	20	22	25

**Q.3** Two dice are thrown. Find the probability that the sum of the numbers in the two dice is 10, given that the first die shows six. (10)

**OR**

**Q.3** Let X be a random variable defined by the density function (10)

$$f(x) = \begin{cases} 3x^2 & 0 \leq x \leq 1 \\ 0 & \text{otherwise} \end{cases}$$

Find E(X).

**Q.4** Find the probability that in tossing a fair coin 8 times, there will appear (i) 3 heads (ii) 6 heads (10)

**OR**

**Q.4** An ATM machine experiences about 2 errors per week. Find the probability that in a given week, there are no errors. (10)

**Q.5** Solve :  $\frac{dy}{dx} = \frac{x-2y+5}{2x+y+1}$  (10)

**OR**

**Q.5** Evaluate :  $(y-2x^3)dx - (x-x^2y)dy = 0$  (10)

**Q.6** Evaluate :  $\int_0^1 \int_x^{\sqrt{x}} (x^2 + y^2) dx dy$  (10)

**OR**

**Q.6** Evaluate :  $\int_0^1 \int_0^y xy e^{-x^2} dx dy$  (10)

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